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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/076,201	02/12/2002	Feng Yang	122-1.1	8601

7590

08/29/2005

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EXAMINER

PENDLETON, BRIAN T

ART UNIT	PAPER NUMBER
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2644

DATE MAILED: 08/29/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/076,201

**Applicant(s)**

YANG ET AL.

**Examiner**

Brian T. Pendleton

**Art Unit**

2644

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 January 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 2/12/02 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-30 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-12, 15, 16, and 19-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isaka et al in view of Erten, US Patent Application Publication 200/0009203. In figure 10, Isaka discloses a method and apparatus for processing speech comprising two input channels ch1, ch2 from signal detectors (inherently microphones), and a speech emphasis section (noise suppression unit) 100. The input channels are coupled to first beamformer 91 and second beamformer 92. Speech emphasis section 100 is shown in figure 13 which digitally processes the signals from the first and second beamformers. Isaka does not disclose that the speech processing apparatus mounted on a mobile communication device, the signal detectors forming a small array. Erten discloses a mobile communication device in figure 9 comprising a microphone array. A voice extraction system is used in the device of figure 9, the objective of the system to remove noise when processing a speech signal. Therefore, it was well known to put microphone arrays on mobile devices for improving the response to speech signals. It would have been obvious to one of ordinary skill in the art at the time of invention to use the speech

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processing system of Isaka on a mobile communications device, as taught by Erten. Claims 1, 2, 4, 5, 15, 16, 19, 20, and 23-27 are met. As to claim 3, the beamformers 91, 92 (shown in figure 2) have an adaptive filter 2 therefore they and speech emphasis section 100 are implemented within a digital signal processor. Per claims 6, 7, 8, 21, and 28, the speech emphasis section has FFT units 101, 104 to process the first and second signals from the beamformers in the frequency domain using spectral subtraction. Per claim 9, there is disclosed weighting section 108. Step S309 discloses that weighting involves multiplication of the signals from the speech signal transformation (paragraph 121) with weights, therefore inherently there is a multiplier configured to receive and scale the first transformed signal (speech) with a set of coefficients. As to claims 10, 11 and 29, the weights (coefficients) are derived in band weight computation section 107 (step S308) which is based on noise power and speech power computations (units 103, 106). The band weight computation section 107 is the gain calculation unit. The weighting section 108 scales the speech signal based on the weights. Per claims 12 and 30, the circuitry of Isaka provide a time varying noise spectrum estimate. As to claim 22, it was obvious to process signals in either the time or frequency domain.

Claims 13, 14, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isaka in view of Erten, as applied above, and further in view of Anderson et al. The combination of Isaka and Erten does not disclose an activity detector configured to receive the first and second signals (speech and noise signals) and provide a control indicative of active time periods whereby the first signal includes predominantly the desired component. However, it was well known in the art, as evidenced by Anderson, to use activity detectors (speech activity detector 200) in spectral subtraction methods and devices. Anderson discloses a spectral subtraction

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method and system comprising speech activity detector 200, speech spectrum estimator 130, noise estimator 120 and spectral gain generator 140. The noise estimator 120 used the output (control signal) from the speech activity detector 200 to generate an estimated noise spectral magnitude signal (figure 2). Use of a speech activity detector 200 greatly improved the accuracy of the noise estimation which in turn enhanced the estimation of the S/N ratio used in the calculation of gain values in a spectral subtraction system. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use an activity detector in the speech emphasis section 100 of Isaka and Erten for the purpose of improving the noise suppression function. Claim 13 is met. As to claim 14, it would have been obvious to one of ordinary skill in the art at the time of invention to adjust the beamformers with the control signal from a speech activity detector for the purpose of maintaining the output signals from the beamformers on the speech and noise signals, respectively, which would have. Regarding claim 17, beamformers 91, 92 in figure 2 have an adaptive filter 24 which as modified by Anderson, receives a signal from a speech activity detector to provide a corresponding filtered signal. As to claim 18, paragraph 65 of Isaka discloses the filter 24 uses a LMS algorithm.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Huang, US Patent Application Publication 2004/0092297.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian T. Pendleton whose telephone number is (571) 272-7527. The examiner can normally be reached on M-F 7-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571) 272-7848. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Brian T. Pendleton  
Examiner  
Art Unit 2644

